FARMLINE

United States Department of Agriculture

Economic Research Service

Volume VIII
Number 6
June 1987

What Future For the Tobacco Industry?

Catfish Are Jumpin' **page 15**

Editor
Jack Harrison

Assistant Editor
Doug Martinez

Editorial Assistant
Martha R. Evans

(202) 786-1494

Contents of this magazine may be reprinted without permission.

FARMLINE is published 11 times a year by USDA's Economic Research Service. Send questions, requests, and editorial comments to *FARMLINE*, Room 228-USDA, 1301 New York Avenue N.W., Washington, DC 20005-4789.

Subscription price is $14 to U.S. addresses ($17.50 foreign). Order from: ERS Publications, Rm. 228-USDA, 1301 New York Ave. N.W., Washington, DC 20005-4789. Ask for *FARMLINE* magazine and make your check or money order payable to USDA/ERS. Include your complete address, with zip code, and your daytime telephone number. Refunds cannot be issued. Foreign customers note: Only checks drawn on U.S. banks, cashier's checks, or international money orders can be accepted.

Please include your mailing label with change-of-address and other requests related to your subscription.

Subscriptions are also available from the U.S. Government Printing Office. For information, write: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *FARMLINE* has been approved by the Office of Management and Budget. Use of commercial or trade names does not imply approval or endorsement by USDA.

PERSPECTIVES

THE INTERNATIONAL DEBT CRISIS "has been a far more serious constraint to the world economy than anyone anticipated," according to Economic Research Service economists Mathew Shane and David Stallings. "It was assumed, in the early part of the crisis, that an adjustment period of 3 years would be sufficient" to get the payment system straightened out, they say. "But, so far, the world economy is not growing out of the debt problem."

The burden of debt on developing countries has seriously restrained development and trade, including agricultural imports, the economists say. Much of the debt has been rescheduled, but they believe this is just prolonging, not solving, the crisis. The debt burden now is as large as it was in 1982.

The total debt of 79 developing countries was $840 billion in 1986. In the 5 years before 1981, the amount of international debt rescheduled was $13.5 billion, by 11 countries. In 1981 through 1986, twenty-one times as much was rescheduled. In 1986 alone, the total was $120 billion, held by 25 countries.

Lenders have not made additional funds available to the countries in trouble. In fact, on a net basis, the banks have been withdrawing credit. Negative net transfers of credit totaled around $30 billion in each of the last three years, 1984 through 1986. Yet in spite of this, total debt has continued to increase because repayments have not exceeded interest costs.

Per capita incomes have fallen, capital formation has declined, and trade has stagnated in the most affected countries. "The fact that such adjustments have not resolved the crisis points to the need to consider more dramatic solutions in the most serious cases," Shane says.

Last summer Shane and Stallings wrote that "writedowns of some portion of the debt may be worth considering," because of "the impact of the debt crisis on trade and development." Recently several major U.S. banks announced that they were adding as much as $3 billion each to loan loss reserves, thus indicating that they probably would be writing off some of the Third World debt.

The major tactic by debtor nations in countering debt problems has been to reduce imports. The total dollar value of world imports declined by nearly $100 billion, to $520 billion, between 1980 and 1985. Asia was the only region to show an increase. In 1981-85, imports fell by $50 billion in Latin America and by $40 billion in North Africa. The oil-exporting nations decreased their imports by $75 billion, and "debt-affected major borrowers" by $61 billion. The decline in each of these market segments was at least 25 percent.

U.S. agricultural exports decreased from 164 million metric tons in 1980 to 110 million tons in 1986. By value, the drop was from nearly $44 billion in 1981 to $26 billion in 1986. More than $5 billion of this decline was in developing countries, with $3 billion in Latin America. A turnaround has occurred, however, and 1987 exports are projected to be 127.5 million tons, valued at $27.5 billion.

The debt crisis can be traced back to the oil price shocks of the 1970's, Shane and Stallings say. The price rise of 1973-74 led to expansionist money policies, growth in exports, and a rapid increase in total debt. But the industrial nations reacted to the second oil shock, in 1979-80, with contractionary monetary policies. This sharply slowed the world economy, raised real interest rates, and induced the current repayment problems. Commodity prices fell sharply and the developing countries suffered greatly reduced incomes while facing massive payments on their debts.

Renewed, sustainable growth by the debtor countries should have been under way some time ago, if the debt crisis had progressed as expected. The debts must be reduced, the economists say, before trade can bounce back and support that badly needed growth.

FARMLINE

AGRICULTURE . . . NATURAL RESOURCES . . . RURAL DEVELOPMENT
Practical economic intelligence from USDA's Economic Research Service

FEATURES

Tobacco Farmers Face an Uncertain Future *by Doug Martinez* 4

New assaults are aimed at tobacco products this year. Anti-smoking campaigns have increased. Americans are buying fewer cigarettes. Tobacco growers have cut production, but the industry is still of multi-billion-dollar size. The role of exports will be important in an uncertain future for the tobacco industry.

U.S. Domination of Wheat Market Unlikely *by Jack Harrison* 8

U.S. wheat exports have fallen sharply in recent years, but the process of recapturing sales is under way. Though still the leader in wheat exports, the United States is not expected to control as large a share of the market as it has in the past. Projections of future sales indicate tough competition worldwide.

Groundwater Vulnerable to Contamination From Chemicals *by Juliana King* 12

A potential for groundwater contamination from agricultural fertilizer and pesticides exists in many parts of the nation. The health stakes are high. Legislation protecting groundwater has been passed by several states and local governments. Two economists analyze the susceptibility of groundwater supplies to contamination.

Catfish 'Feedlots' Expand Across the South *by Juliana King* 16

Production of farm-raised catfish in this country has increased dramatically in the last 10 years. The catfish industry has been expanding its markets, but is still primarily regional. Aquaculture is booming, mainly in the South, but it's a difficult way to make a profit if you don't have the expertise.

DEPARTMENTS

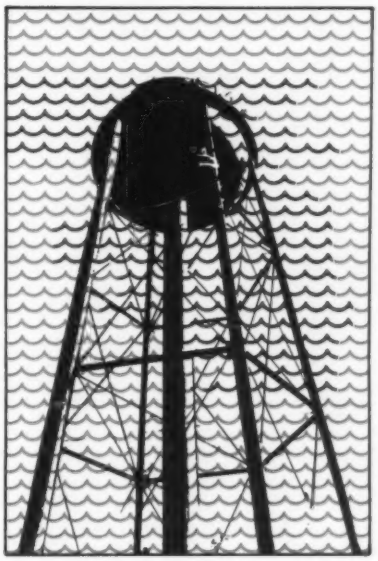
Reports In the News: Stress in Farming; Livestock in China 15

Farmline Trends: Monthly Price Monitor; Agricultural Finances 18

SPECIAL IN THIS ISSUE

1987 Reports Calendar 10

You can save this handy guide to July-December release dates for situation and outlook reports of the Economic Research Service, crop and livestock reports of the National Agricultural Statistics Service, and supply-demand estimates of the World Agricultural Outlook Board.



Tobacco Farmers Face an Uncertain Future

For the tobacco industry, the 1980's began where the 1970's left off, with each year seeming to bring a fresh assault on tobacco products.

In fact, the battle over smoking has intensified, with more anti-smoking campaigns and more "No Smoking" signs in more places. Taxes on tobacco products have been increased substantially, and the steady, long-term growth in the number of cigarettes sold on the U.S. market has turned around.

Per capita figures are even worse.

"On a per capita basis, Americans are now smoking fewer cigarettes than at any time since 1944," says economist Verner Grise of USDA's Economic Research Service. Annual use by adults peaked at 4,345 cigarettes per person in 1963, but was down to 3,274 last year.

How many Americans still smoke? About 50 to 55 million, which is 30 percent of those 18 years and older, according to the latest Gallup Poll. And they're lighting up a lot of cigarettes — 584 billion in 1986. But if current trends continue, says Grise, "use might decline 20 to 25 percent by the year 2000, to around 450 billion cigarettes."

Following the pattern of 1986, "reduced demand for tobacco products will reach beyond cigarettes to include cigars, smoking tobacco, snuff, and chewing tobacco," he says.

Those are domestic product projections, Grise points out. U.S. tobacco leaf exports may fare a bit better. "Export volume may rise a little because of lower U.S. prices prompted by lower loan rates, the weakening of the dollar, and some delayed shipments."

Pressures Are Increasing

In the United States, the pressures on tobacco farmers and the tobacco manufacturing industry are intensifying. Recently, U.S. Surgeon General C. Everett Koop, a vocal opponent of cigarette smoking, called for a smoke-free society by the year 2000.

"That almost surely will not occur," says Grise, "but anti-smoking activity, including recent legislation and the threat of more to come, continues to affect the industry."

On a per capita basis, Americans are now smoking fewer cigarettes than at any time since 1944.

He says that 41 states and the District of Columbia now have laws that either prohibit smoking in certain places or segregate smokers from nonsmokers. Ten states regulate smoking in the workplace of both private and government employers.

"A large number of towns and cities have some smoking restrictions," says Grise. "And the U.S. Department of Health and Human Services and voluntary health agencies have stepped up efforts to discourage smoking. The cumulative effect of publicity and ordinances on smoking is difficult to measure, but it almost certainly accounts for at least some of the downward trend in consumption."

Grise notes that the federal government has enacted a partial ban on cigarette smoking in buildings it owns and leases. "Under this ruling, cigarette, cigar, and pipe smoking is banned in shared office space, lobbies, corridors, restrooms, elevators, libraries, and classrooms. Smoking generally will be permitted in private offices."

He adds that the military services have also enlisted in the anti-smoking effort.

"Under a new health promotion program ordered by the U.S. Department of Defense, the Air Force, Army, Navy, and Marines have initiated stringent smoking restrictions that apply to both military personnel and civilian employees. Smoking is banned in Army vehicles and restricted in offices. It is also restricted in Navy and Marine offices, ships, and aircraft. On paper at least, smoking will be permitted only to the extent that it does not endanger life or property or risk impairing nonsmokers' health," Grise says.

The restrictions on smoking tend to shorten the total time available for cigarette smoking and probably reduce consumption, Grise says. "Fifteen years ago, cigarettes, cigars, and pipes could be smoked almost anywhere. Then, the 1972 Surgeon General's report on smoking and health warned of the possible dangers of passive smoking, which occurs when nonsmokers inhale smoke-filled air."

The anti-smoking activity even extends, to a greater degree than it has in the past, to cigarette packages themselves.

"Since October 1985, warning labels on cigarette packages have consisted of four rotating messages about the hazards of smoking," he says. "The warnings are about 50 percent bigger than the ones they replaced."

Prices Also Have Impact

But it's not just the restrictions and health warnings that have persuaded many people to cut back or cut out their use of cigarettes and other tobacco products, says Grise. Rising prices may be at least as important—and probably even more so.

Since August 1982, he says, wholesale cigarette prices have been raised 12 times for a total increase of 67 percent. Retail prices have jumped 52 percent in the same period. "The average retail price of a pack of cigarettes is now $1.12."

Grise says retail cigarette prices will continue to go up this year because of tax hikes by state and local governments and higher cigarette manufacturing costs (and markups). However, the rate of increase is expected to be similar to the slower rate of 1984-86 rather than the accelerated 1983 rate. Between June 1986 and December 1986, prices rose about 3 percent. "This rate is expected to continue in 1987. If so, increased sales of generic and mid-priced brands could hold the drop in total consumption to around 2 percent," Grise says.

Part of the retail price increase on cigarettes is related to higher excise taxes, Grise says. In 1986, seven states raised excise taxes an average of 4 cents a pack. In 1985, twelve states raised such taxes an average of 6 cents a pack. "The weighted average state tax was 16.6 cents in 1986, resulting in

Declining sales of cigarettes have resulted in falling income for many tobacco farmers.

a combined average state and federal tax of 32.6 cents per pack."

Adding to the substantially higher cost of cigarettes since 1981 has been the increase in manufacturers' costs and markups.

The impact on the tobacco farmer has come in the form of declining prices and in many cases, depressed income. Production has been falling, particularly since 1975.

Far-Reaching Changes

The shrinkage of the industry may produce far-reaching changes, not only for tobacco farmers, but for the communities and regions in which they work, Grise says.

For farmers looking at survival strategies, one obvious answer is diversification.

That was the advice recently offered by North Carolina's State Goals and Policy Board. In March, the board said tobacco "is a crop whose future is in jeopardy" and recommended that the state's tobacco farmers consider diversifying their operations to include lettuce, carrots, celery, and other produce.

North Carolina once relied on tobacco for more than half of its farm income, but now that proportion is down to about one-fifth.

On the production side, U.S. tobacco output in 1986 was down by more than 20 percent from 1985 production. This year's tobacco crop is projected to increase about 4 percent from 1.2 billion pounds in 1986. But that's still considerably lower than the output of the 1970's and early 1980's.

The tobacco manufacturing industry doesn't appear to have been seriously affected. Some analysts, in fact, say the industry is still doing well despite declining demand for its products.

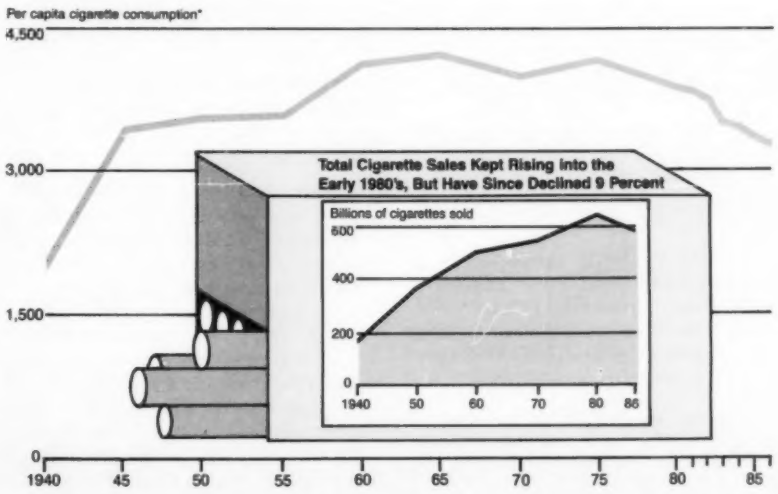
Jeffrey E. Harris, associate professor of economics at the Massachusetts Institute of Technology, says the retail price of cigarettes rose 36 percent more than the general inflation rate from 1981 to 1986.

"Less than one-quarter of the increase went to the higher federal excise tax," Harris says. "More than half went to manufacturers, (and) the remainder went to increased state and local taxes, as well as to retailer markups."

Harris further states that tobacco companies, concerned about the long-term future of the tobacco market, have begun to diversify into other lines of business.

In two of the largest mergers, tobacco companies bought food marketing firms. In 1985, Philip Morris Company acquired General Foods Corporation for nearly $6

After Peaking in the Mid-1960's, Per Capita Consumption of Cigarettes Has Fallen 25 Percent



*Per capita consumption is calculated by dividing the adult population (18 and over) into total domestic cigarette sales.

billion and R.J. Reynolds bought Nabisco Brands, Inc., at a cost of $4.9 billion.

Contributions to Economy

Of course, tobacco companies aren't abandoning the tobacco trade. And in their defense, they cite the industry's contributions to the American economy.

Speaking late last year at USDA's annual outlook conference, C.D. White, vice president of Brown & Williamson Tobacco Corp., said that "tobacco will continue to play a major role in the economy of this nation. More than 700,000 Americans earn all or part of their income from tobacco. At retail, tobacco is a (more than) $30 billion business that generates some $9 billion in federal and state tax revenues. Each year, our industry contributes nearly $2 billion to the nation's balance of payments."

White went on to say that "the tobacco industry will continue to prosper. However, manufacturers are compelled to make their operations as efficient as possible."

He added that "for international sales, the outlook is brightened by the prospects of continued market growth. The Far East markets, where U.S. tobacco products have been severely restricted, offer particularly good expansion potential."

The industry has certainly been helped in its export marketing by lower, more competitive U.S. prices created by lower loan rates.

In the domestic market, another heartening sign for the tobacco industry has been the apparent loyalty of many cigarette smokers in the face of climbing prices, caused, in part, by increased taxation.

"Although cigarette consumption is expected to fall further in 1987," says economist Grise, "its decline will be lessened as many customers substitute generic and mid-priced cigarettes that are 15 to 35 percent cheaper than standard brands."

Moreover, the tobacco industry has been buoyed by recent court decisions on product liability. Early in 1987, for example, the U.S. Supreme Court refused to overturn lower court rulings affirming that the public has been adequately warned of the health hazards from tobacco. The Supreme Court action resulted from a lawsuit filed against the Liggett Group, Inc., alleging that tobacco companies had been negligent in advising the public of the risks of cigarette smoking.

In its decision, the Supreme Court upheld a U.S. Circuit Court of Appeals ruling of April 1986 that Congress—in requiring health warnings to be printed on all cigarette packets—had intended to prohibit liability lawsuits claiming inadequate advance warnings of product dangers.

That doesn't put a halt to such lawsuits or preclude the possibility that court decisions may eventually go in favor of some of the plaintiffs. In fact, by mid-March of this year, more than 100 product-liability lawsuits, alleging wrongful death or injury from cigarette smoking, were pending in U.S. courts.

A Smaller Base

Looking to the future, Grise says tobacco production will likely have a profitable but somewhat smaller base compared with the late 1970's and early 1980's.

"Back 3 or 4 years ago, things looked pretty bleak. Then the situation improved beginning in April 1986 when the support level was reduced, making prices more competitive. Quotas were also lowered at the same time, and a more market-oriented approach is now used to set quota levels," he says.

In order to reduce price-depressing surpluses even further, he explains, quotas are determined by the following formula: flue-cured and burley quotas are now based on intended purchases by cigarette manufacturers, average annual exports for the preceding 3 years, and the amount of tobacco needed to attain specified reserve stock levels (15 percent of the effective quota or a minimum of 100 million pounds of flue-cured and 50 million pounds of burley). Manufacturers also took the additional step of buying up most of the surplus stocks of tobacco. These purchases, which began in 1986, can continue until 1991 for burley tobacco and until 1994 for flue-cured.

These changes, Grise says, are bringing the "supply-demand balance into better equilibrium, and prices are now more competitive."

And although domestic consumption is declining, the tobacco industry has shown its ability to adapt to changing market conditions and consumer concerns.

In this respect, Grise cites the example of filter cigarettes.

Their introduction in the late 1940's was followed in the early 1950's by the release of studies linking cigarette smoking and various diseases, including lung cancer and heart disease. Health concerns gave an added boost to filters, which were often preferred for their milder taste and for keeping tobacco out of the smoker's mouth.

In 1950, about 1 percent of the cigarettes Americans smoked were filter-tipped. By 1970, that figure had risen to 80 percent.

In the 1970's, the health focus shifted to the low-tar aspect of cigarette smoking.

From the mid-1970's to 1981, sales of low-tar cigarettes soared. In 1974, low-tar cigarettes accounted for 9 percent of sales. By 1981, the proportion had reached 60 percent. In the last 5 years, Grise says, there has been a modest movement back to full-flavored cigarettes, which are generally higher in tar. The share for low-tar cigarettes is now about 54 percent.

And more change is certainly at hand for the tobacco industry.

"Tobacco farmers will continue to become more efficient in their production of tobacco and some will diversify their operations. Furthermore, the tobacco industry will put an even sharper focus on expanding exports," Grise says. □

[*Based largely on information provided by economist Verner Grise of the Commodity Economics Division, Economic Research Service.*]

Exports Offer Best Hope for Growth in Sales

Faced with what they call a "mature" U.S. market, tobacco industry officials are trying to reach more smokers abroad.

In this export effort, the American tobacco industry is coming up against the challenges faced by many other marketers of U.S. farm products: closed or highly protectionist markets, and increasing foreign competition.

The United States is already the world's largest exporter of tobacco. And, in 1987, industry analysts anticipate some modest gains in export volume. But the same officials say the United States would sell more abroad if trade barriers were trimmed or removed.

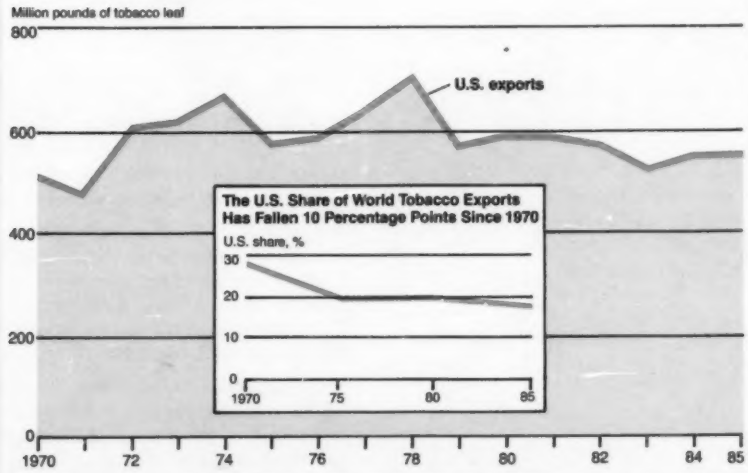
"The United States can have good quality tobacco for sale at competitive prices and still not increase its export sales if our tobacco is denied access to foreign markets because of trade restrictions by our trading partners," says J.T. Bunn of the Raleigh, N.C.-based Leaf Tobacco Exporters Association.

Bunn, executive vice-president of the association, said in an interview that the place to begin is with the global trade negotiations in Geneva, Switzerland. Those talks are being held under the auspices of the General Agreement on Tariffs and Trade (GATT).

"The United States should aggressively seek to lower or abolish, on a reciprocal basis, both tariff and nontariff barriers to tobacco trade," Bunn says.

Among the factors that could have a positive influence on U.S. tobacco trade are: the availability of high quality U.S. leaf, the weakening of the U.S. dollar relative to foreign currencies, more competitive U.S. prices as a result of lower loan rates, prospects for eventual reductions of trade barriers in GATT negotiations, and continued foreign preference for the American-blend cigarette.

U.S. Tobacco Exports Peaked in 1978 at 707 Million Pounds, But Have Dropped Sharply Since Then



Bunn is also careful to note potential problems.

High on the list of factors that could blunt the drive to increase exports: competition from developing countries such as Zimbabwe and Brazil, the duty (tariff) preference enjoyed by European Community (EC) member nations and some of their suppliers, and lower U.S. production quotas, which may limit quantities of some of the high quality grades required by foreign customers.

Bunn notes that in 1986, "we lost ground as the percentage of high quality ripe and mature grades decreased, directly affecting the interests of our export customers."

Bunn adds that suppliers who compete with the United States "have found tobacco to be a good source of foreign exchange. And most of these competitors are developing countries which have a lower cost of production and enjoy duty preferences in the EC."

He says that "many competing suppliers can be expected to go all out in their efforts to maintain or expand their share of the world tobacco market."

Overall, Bunn says, "world trade in tobacco can be expected to increase at a modest pace in the period ahead. Thus, to increase its share of world tobacco trade, the United States will have to regain markets from current suppliers."

That won't be easy, he advises. From 1960 to 1964, about 30 percent of U.S. tobacco was exported. From 1981 to 1985, exports increased to about 39 percent of the crop, making the industry more export-dependent. However, the U.S. share of world exports fell from 28 percent in 1970 to 18 percent in 1985.

"We lost a substantial share of world tobacco markets over a period of several years. Regaining our former share of world markets will be a slow and difficult process, but it should be our long-term goal," Bunn contends.

U.S. Domination of Wheat Market Unlikely

The United States is expected to remain the world's leading exporter of wheat, despite a sharp drop in sales the last few years.

But tougher competition, mainly from the European Community, makes it unlikely that the U.S. share of wheat exports will return any time soon to the high levels obtained in the 1970's, says Mathew Shane, an economist with USDA's Economic Research Service.

Shane has projected possible changes in the wheat export market to the year 2000. His projections include a U.S. market share of about 35 percent in 2000. Historically above 40 percent, the U.S. share fell to 29 percent in 1985/86.

Shane expects that at the turn of the century, world wheat exports will total about 160 million metric tons annually, nearly double the 1985/86 level. He says that Canada is likely to have about 20 percent of the market, France 16 percent, Australia 9 percent, and Argentina 8 percent. These shares would represent gains for France and Argentina, a loss for Australia, and the same proportion for Canada.

The market-share projections are based on past patterns and current trends, Shane says. "Of course, a lot of things could happen to change the picture." Shane's recent study is part of a comprehensive ERS project on competitiveness in wheat exports.

Markets Could Be Regained

Shane says he is optimistic that the United States can regain a substantial portion of the lost wheat sales. "It depends on what policies are implemented by the United States and other countries. We might be able to discourage our competitors from continuing at current levels of production. I think the EC will cut back its high wheat subsidies," Shane says.

This could occur, the economist believes, because of two types of pressure on the EC—budgetary and political. "The EC is spending a lot of money on agricultural subsidies. The amount has increased because the 1985 U.S. farm bill lowered the loan rate 25 to 30 percent, and the dollar has depreciated, making U.S. wheat cheaper. There is pressure from within the EC to reduce the amount being spent to provide high returns to wheat growers," Shane says. "In addition, there is increasing political pressure, from the United States and developing countries, against EC policies that restrict competition."

U.S. policies also have been part of the problem for this country's wheat growers and exporters, Shane says. "We made it profitable for other countries to expand their wheat production," he adds, citing the 1981 farm bill as a reason. That bill provided for annual increases in the loan rate and target price. "As the dominant exporter, we set the price. Other countries were guaranteed continuing price increases, and thus had an environment, created by this country, that encouraged production increases."

Several exporters, especially the EC, also have boosted their shares of the market through export subsidies.

U.S. Policies Have Changed

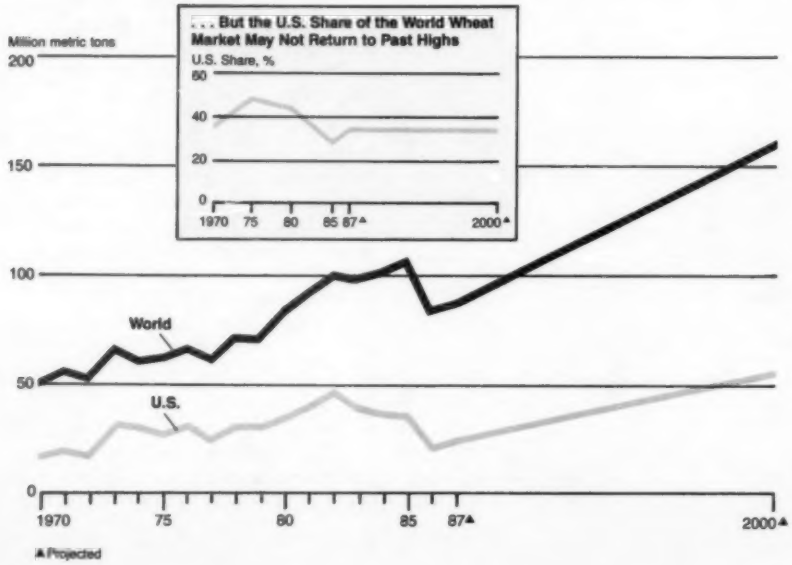
The 1985 farm bill is a different story, however. If the goal is to restore U.S. competitiveness, Shane says, the bill was a step in the right direction.

U.S. wheat sellers would like to return to the competitive peak they reached about 15 years ago, when they had about 50 percent of the export market. (That was a time of big sales to the Soviet Union, which had been hit by crop failures.) The U.S. export share stayed about 40 percent for the next 10 years, until falling to 38 percent in 1983/84.

The volume of U.S. wheat exports reached a record 49 million tons in 1980/81. Then the big skid began. U.S. sales were almost halved in 4 years, falling to 25 million tons. Total world exports also fell, though only by 15 percent, to 85 million tons.

Many countries have been increasing their wheat production, and this has hurt several of the major exporters—especially the United States. World production this year is likely to break the record of 512 million tons

Recent Declines in U.S. Wheat Export Volume Are Expected to Turn Around . . .



France Now a Leader in Wheat Trade

France, the land of champagne and Chateaubriand, has become known as well for its amber waves of grain.

How did France get to be a leading producer and exporter of wheat? Subsidies to growers are part of the answer. Such assistance is provided in generous amounts through the European Community's Common Agricultural Policy (CAP).

The EC price support program "has been a major contributor to France's nearly 10 percent annual growth rate in wheat exports during the past 15 years," says economist Mark Newman of USDA's Economic Research Service.

He adds, however, that production and marketing costs in France, especially for the large farms that grow most of the wheat, are generally competitive with U.S. costs. Wheat production should continue to be profitable for these efficient producers, even in the event of major EC subsidy cuts, Newman says.

Competition from France is a growing problem for U.S. wheat producers, who have had a difficult time maintaining their overseas sales in recent years.

France has produced about 30 million metric tons a year the last 3 years. This is nearly 50 percent of all wheat grown in the EC, and about 6 percent of world production. France has been exporting about 18 million tons annually, a third of which goes to the other EC countries.

Two-thirds of EC wheat exports, and 12 to 15 percent of the world total, come from France. More than 90 percent of the French exports go to other European countries (including the Soviet Union), and to Africa.

Proximity to those markets is one advantage enjoyed by the French, who can save considerably on transportation expenses, compared with U.S. growers.

French wheat production has tripled since 1960, mainly because of yield increases—to at least 90 bushels per acre in recent years. Such yields have been achieved through generous use of fertilizer and other chemicals. French growers can afford that sort of intensive production effort because of the high prices they are paid for their crop. Also, France's major wheat-producing areas, such as the Paris Basin, normally receive more rainfall than their U.S. counterparts.

French wheat growers are definitely producing for the export market. Production far exceeds domestic demand, increasing from 117 percent of national consumption in 1960 to 319 percent in 1984.

Import levies have kept lower priced foreign wheat from competing effectively for EC markets. And EC wheat export subsidies were $165 a ton (about $4.50 a bushel) in March 1987. The subsidy varies depending on currency exchange rates, but the bottom line for French wheat growers is a price of nearly $6 a bushel for their crop.

Projections by ERS economist Mathew Shane indicate that France is likely to control about 16 percent of world wheat exports in the year 2000 (if current policies and trends continue).

Of course, the EC does not have a monopoly on price supports. A comparison of U.S. and EC levels of support, Newman says, should take into consideration U.S. deficiency payments, the costs of acreage reduction and export enhancement programs, and food aid programs.

set 2 years ago. About 17 percent of the wheat grown this year is expected to enter the export market.

The wheat trade remains highly concentrated, Shane notes, with just 13 countries accounting for more than 95 percent of wheat exports, and 18 countries buying more than 71 percent of the imports.

Export Club Has New Members

Only a few countries export substantial amounts of wheat, but the makeup of that group has changed. Shane notes that 8 of 13 exporters in 1981/83 had been importers in 1961/63. Another example of the volatility of the trade is the shift by the Soviet Union from major exporter status in the early 1960's to major importer more recently.

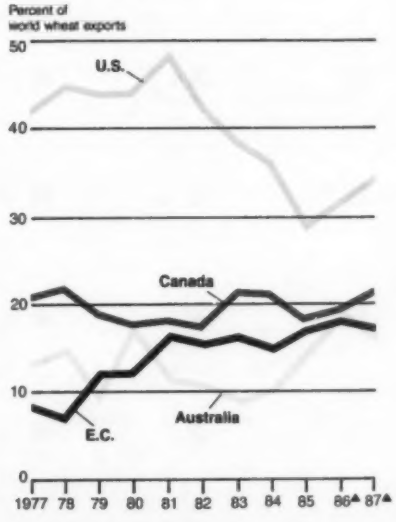
Several EC countries are among the most striking examples of the rapid changes that have occurred in the wheat trade. The United Kingdom bought 11 percent of world wheat imports 25 years ago, but has become an exporter. And France increased its share of the exports from 4 percent to 15 percent in the same time period. The 10 leading importers in one recent year were the Soviet Union, China, Egypt, Brazil, Poland, Algeria, Iraq, Iran, Morocco, and South Korea.

Shane sees some irony in the EC trend because Europe has not traditionally been a producer of surplus amounts of wheat. "With high population density and expensive price tags on land in much of Europe, grain production has been a fairly inefficient use of the resources," Shane says. He adds, however, that a political decision was made to pay the price of building up the wheat sector of the EC farm economy. But this has resulted, especially in France, in strengthening the wheat industry to the point that it is now highly competitive.

This means trouble for U.S. wheat growers, who will have a difficult time regaining the portion of the wheat trade that was lost during the last few trying years. □

[Based primarily on information provided by economist Mathew Shane of the Agriculture and Trade Analysis Division, Economic Research Service.]

The Market-Share Gap Has Narrowed Between the United States and Other Top Wheat Exporters



▲86 Preliminary, 87 Projected

1987 Reports Calendar
July-December

Titles of Situation and Outlook Reports of the Economic Research Service are printed in color. Summaries of reports are released at 3 p.m. on the dates shown. Copies of complete reports are due off press about a week later. The ***World Agricultural Supply and Demand Estimates,***

JULY

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
		1 *Egg Products*	2 *Poultry Slaughter* *Dairy Products*	3
6	7 *Sub-Saharan Africa* *Celery*	8 *Noncitrus Fruits & Nuts-Midyear Supplement*	9 *World Agricultural Supply & Demand* *Crop Production*	10
13 *Turkey Hatchery*	14 *Mink*	15	16 *Milk Production*	17 *Agricultural Outlook* *Vegetables*
20 *Dairy* *Catfish*	21 *Farm Production Expenditures, 1986 Summary-Final*	22 *World Food Needs & Availabilities*	23 *Oil Crops Yearbook* *Eggs, Chickens, & Turkeys*	24 *Cold Storage* *Cattle on Feed* *Livestock Slaughter*
27	28 *Peanut Stocks & Processing*	29 *Fruit Yearbook*	30	31 *Agricultural Prices*

AUGUST

MONDAY	TUESDAY	WEDNESDAY
3 *Poultry Slaughter* *Egg Products*	4 *Dairy Products*	5 *Livestock & Poult*
10 *Vegetables*	11 *World Agricultural Supply & Demand* *Crop Production*	12 *Farm Income* *Turkey Hatchery*
17 *Sugar Market Statistics*	18 *Econ. Indicators of the Farm Sector*[2] *Cranberries*	19 *Agricultural Outlook*
24 *Filbert Production* *Eggs, Chickens, & Turkeys*	25	26 *Dairy Yearbook*
31 *Vegetable* *Agricultural Prices*		

OCTOBER

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
			1 *Egg Products*	2 *Poultry Slaughter* *Dairy Products*
5 *Cherry Utilization*	6 *Celery*	7	8 *World Agricultural Supply & Demand* *Crop Production*	9 *Econ. Indicators of the Farm Sector*[2] *Vegetables*
12	13 *Turkey Hatchery*	14	15 *Milk Production*	16
19 *Agricultural Outlook*	20 *Dairy* *FATUS*[3] *Catfish*	21	22 *Eggs, Chickens, & Turkeys*	23 *World Food Needs & Avl'bilities: Update* *Cold Storage* *Cattle on Feed* *Livestock Slaughter*
26	27	28 *Peanut Stocks & Processing*	29 *Oil Crops* *Rice Stocks*	30 *Econ. Indicators of the Farm Sector*[2] *Agricultural Prices*

NOVEMBER

MONDAY	TUESDAY	WEDNESDAY
2 *Poultry Slaughter* *Egg Products*	3 *Dairy Products*	4 *Livestock & Poult*
9 *World Agricultural Supply & Demand* *Crop Production*	10	11
16 *Sugar Market Statistics* *Cattle on Feed*	17 *Fruit*	18 *Agricultural Outlook*
23 *World Agriculture*	24 *Eggs, Chickens, & Turkeys*	25
30 *Agricultural Prices*		

[1] Reports cover inputs, Aug. 13; and cropland, water, and conservation, Sept. 21.
[2] Reports cover costs of production, Aug. 18; farm sector review, Oct. 9; national financial summary, Oct. 30; state financial summary, Dec. 4; and production and efficiency statistics, Dec. 17.
[3] Foreign Agricultural Trade of the United States.

issued by the World Agricultural Outlook Board, are also indicated in color on their release dates. To request subscription information on any of these reports, write: EMS Information, Room 226, 1301 New York Ave. NW, USDA, Washington, DC 20005-4789.

Titles of reports issued by the Agricultural Statistics Board of the National Agricultural Statistics Service (formerly the Statistical Reporting Service) are printed in black. Complete reports are released, most at 3 p.m., on the dates shown. To request subscription information, write: Agricultural Statistics Board, Room 5829 South Bldg., USDA, Washington, DC 20250.

EDNESDAY	THURSDAY	FRIDAY
5 estock & Poultry	6 Celery	7
12 m Income key Hatchery	13 Agricultural Resources[1] Mushrooms Milk Production	14 Cotton & Wool Yearbook Cattle on Feed Farm Labor
19 ricultural Outlook	20 Exports FATUS[2] Catfish	21 Feed Cold Storage Livestock Slaughter
26 ry Yearbook	27 South Asia	28 Rice Stocks Peanut Stocks & Processing

SEPTEMBER

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	1 Egg Products	2 Poultry Slaughter	3	4 Fruit Celery Dairy Products
7	8	9 Vegetables	10 World Agricultural Supply & Demand Crop Production	11 Sugar & Sweetener Turkey Hatchery
14	15 Milk Production Cattle on Feed	16 Tobacco	17 Wheat	18 Agricultural Outlook Hop Stocks Citrus Fruits
21 Agricultural Resources[1] Catfish	22	23 World Agricultural Eggs, Chickens, & Turkeys	24	25 Rice Potatoes Cold Storage Livestock Slaughter
28	29 Peanut Stocks & Processing	30 Grain Stocks Hogs & Pigs Agricultural Prices		

EDNESDAY	THURSDAY	FRIDAY
4 estock & Poultry	5	6 Vegetable Yearbook Celery
11	12 Farm Income	13 Cotton & Wool Turkey Hatchery Milk Production Farm Labor
18 ricultural Outlook	19	20 Feed Yearbook Catfish Cold Storage Livestock Slaughter
25	26	27 Peanut Stocks & Processing

DECEMBER

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	1 OUTLOOK CONFERENCE Exports Egg Products	2 OUTLOOK CONFERENCE Poultry Slaughter	3 OUTLOOK CONFERENCE Dairy Products	4 Econ. Indicators of the Farm Sector[2] Celery
7	8	9	10 World Agricultural Supply & Demand Crop Production	11 Turkey Hatchery
14 Vegetables	15 Tobacco Yearbook Potato Stocks Milk Production Cattle on Feed	16	17 Econ. Indicators of the Farm Sector[2]	18 Agricultural Outlook FATUS[2] Catfish
21 Rural & Agricultural Finance Cold Storage	22	23 Eggs, Chickens, & Turkeys	24	25
28 Livestock Slaughter	29 Peanut Stocks & Processing	30	31 Agricultural Prices	

Groundwater Vulnerable to Contamination From Chemicals

Imagine signs all around town warning you not to drink the water that pours from your faucet.

Residents of twelve towns in Italy, one with a population of 70,000, don't have to use their imaginations. This spring, the Italian government condemned their well water supplies. According to authorities there, the groundwater feeding those wells is contaminated with herbicides used on nearby rice paddies.

While a comparable incident may never happen in the United States, agricultural chemicals have been found in some groundwater sources. For example, groundwater in parts of California and Iowa has been found to contain pesticides and nitrates. In those areas, the water is filtered, clean water is brought in from other locations, or other accommodations are made.

"We are not facing a panic situation here," stresses economist Elizabeth Nielsen of USDA's Economic Research Service.

"Nevertheless, the potential for groundwater contamination from agricultural sources does exist, and could increase, unless steps are taken to prevent it," adds her colleague, economist Linda Lee.

Nielsen and Lee base these observations on their recent analysis of the susceptibility of U.S. groundwater supplies to contamination from agricultural fertilizers and pesticides. The areas where groundwater is most vulnerable to possible contamination encompass about 1,400 counties.

Nielsen and Lee are quick to point out that their research is preliminary and only identifies broad areas where contamination might be found. The study does not pinpoint actual contamination sites. Such information is largely unavailable because testing of wells has not been done on a nationwide basis, Nielsen says.

A First Step

Instead, Lee and Nielsen took the first step, using data from a variety of sources, such as the Environmental Protection Agency (EPA) and the U.S. Geological Survey (USGS).

Once groundwater is contaminated, it could remain that way for years, even centuries.

"We combined information on various nitrogen fertilizer and pesticide applications, the physical vulnerability of aquifers, and actual levels of nitrates found in groundwater to identify regions where these resources were potentially contaminated. We then estimated the number of people depending on groundwater in the vulnerable areas," says Lee.

Their work, and that of state and local researchers, can help target areas where testing of groundwater may be the next logical step.

Concerns about the long-term consequences of agricultural chemical contamination are justified, the economists say, even though there is little hard evidence indicating how widespread the problem is. Once groundwater is contaminated, it could remain that way for years, even centuries, they point out.

The health stakes related to human ingestion of contaminated water are high—more than 95 percent of the rural population gets water from private wells. Heavy concentrations of nitrates (from nitrogen fertilizers) in drinking water can cause methemoglobinemia, a blood disorder commonly called "blue baby syndrome" which can be fatal to infants. But that is only one of many ailments linked to chemicals.

When pesticides are found in groundwater, the concentrations are usually very low. "Unfortunately, we don't really know what the effects of this low-level exposure are," says Lee.

Of course, toxic substances can also come from a multitude of manmade sources—underground petroleum storage tanks, landfills, septic tanks, and industrial waste (all of which may pose greater threats than agricultural chemicals). Contamination from any of these sources occurs when chemicals leach or leak into underground reservoirs known as aquifers. These reservoirs are replenished by precipitation.

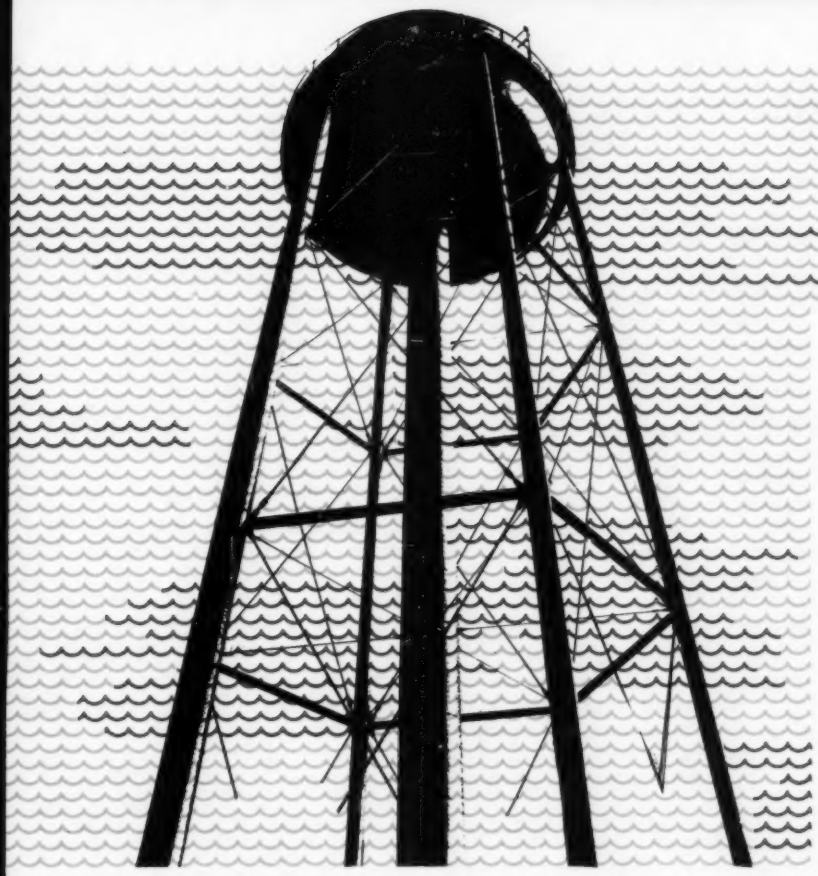
Not surprisingly, potential contamination from agricultural chemicals appears to be greatest in intensively farmed areas of the United States. However, the areas most vulnerable to pesticide contamination of groundwater are not necessarily the same areas where the potential for nitrate contamination is greatest, Lee says.

Potential Nitrate Problems

In looking for potential nitrate contamination, the economists analyzed data on available nitrogen application rates, USGS data on actual groundwater nitrate levels, and an EPA formula that measures the vulnerability of groundwater sources. Their results point to about 300 counties that are potentially vulnerable to nitrates leaching into the groundwater. These counties are located predominantly in the Great Plains, parts of the Corn Belt, Arizona, California, Delaware, Maryland, Montana, Pennsylvania, and Washington.

A compounding problem in those areas could be that substantial amounts of nitrogen fertilizers are used to grow crops. "Studies suggest that higher nitrogen application rates can increase the likelihood of groundwater problems," says Lee.

According to the economists, other factors contribute to the potential for contamination. For example, large accumulations of nitrates in the groundwater of the Great Plains and the Southwest may be partially the result of natural sources. In those regions, naturally occurring and normally stable deposits of nitrates may be leaching into groundwater as the result of farming practices such as cultivation and irrigation. Farm practices, soil types, precipitation patterns, and underground rock formations can all affect aquifer and groundwater vulnerability. For instance, aquifers in areas where limestone is prevalent seem prone to contamination. This vulnerability factor helps explain variations in contamination potential, say the economists.



A number of areas with high levels of nitrates, such as Kansas, West Texas, southern Arizona, and the Chesapeake Bay region, also have a large number of farm animals. The combination of fertilizer applications and animal waste from concentrated livestock, dairy, and poultry operations probably compounds the nitrate problem.

Although Rockingham County, Virginia, is not within the larger geographic areas where potential nitrate contamination may be greatest, the county is a case in point. It has a large number of dairy and poultry farms and, consequently, a large amount of animal waste. And Rockingham County has a problem—nitrate contamination.

Fred Givens, a soil and water conservation specialist at Virginia Tech, is heading a project to improve the area's water quality. Rockingham producers, he says, are the state's leading purchasers of commercial nitrogen and phosphorus fertilizers, even though they have enough on-farm manure to meet the cropland's nitrogen needs.

The water quality project in Rockingham is aimed at teaching producers that the nutritive value of their animal waste can cut their costs for—and use of—commercial fertilizer. Farmers spread manure on their cropland, but it's a combination of the manure and the overuse of commercial fertilizer that creates a potential problem.

Some wells in the county have had contamination levels of 100 milligrams of nitrogen per liter of water—10 times the limit recommended for drinking water. But the extent of the contamination throughout the county is hard to measure, Givens says.

More Widespread Concerns

If potential nitrate contamination was identified in a few hundred counties, pesticide concerns may be more widespread. The study by Nielsen and Lee found about 800 counties along the Eastern Seaboard, the Gulf Coast, and in the upper Midwest where groundwater may be vulnerable to pesticide contamination. A large part of the U.S. population is concentrated in these areas, the economists warn.

They add that conditions exist for the potential contamination from both fertilizers and pesticides in an additional 300 counties. These counties, they say, fall in the Corn Belt, Great Lakes states, and Northeast.

Altogether around 1,400 counties nationwide were identified where groundwater could potentially become contaminated with nitrates, pesticides, or both. More than 19 million people in these areas obtain their water from private wells, including 12 million where pesticides are a potential threat, nearly 2 million where nitrates could be a problem, and 5 million where groundwater supplies face possible combined pesticide and nitrate contamination.

Another 35 million people in these areas of potential contamination get their water from public groundwater systems. While these systems are fewer and more closely monitored, they too can become contaminated, Nielsen says.

Private wells are generally more susceptible to contamination because they are often shallower and not as well-constructed. They are also more expensive to monitor because there are so many of them, says Lee.

Furthermore, cleaning up contaminated aquifers, whether from agricultural or other sources, is expensive and often impossible. This is because agricultural chemicals filter into aquifers after being applied to large areas, such as crop fields, and therefore do not concentrate in any one spot, says Lee.

At the same time, establishing a system to protect the country's underground water supplies will be difficult. Contamination may occur on a regional scale that often extends beyond a single jurisdiction. Therefore, a regionally focused policy may be needed to meet individual community priorities, the economists say.

Local governments need to be able to address their specific problems. Since nitrates and pesticides are not always found together, a program that focuses on one, the other, or both, may not be the most effective approach and may be unnecessarily costly. It would do little good, says Lee, to test a county's underground water supplies only for nitrates if that county is more likely to have a pesticide problem.

Testing Costs

Costs of testing groundwater supplies are high, say the economists. They estimate

that testing community wells in all the potentially contaminated areas for just two pesticides could cost $14 million, and that's only the beginning. Testing of private wells for nitrates and two pesticides in those counties could cost $900 million to $2.2 billion.

Even the cost of individually testing private wells can be high. Based on a survey of private labs in potentially contaminated areas, Lee and Nielsen found that costs varied considerably for various tests. Nitrate analysis ran from $13 to $28. Lab analyses for two pesticides ranged from $123 to $308. "These prices include sample bottles, shipping, and labor. They do not reflect the lower fees generally charged by public labs," says Lee.

Household and communities that must deal with polluted groundwater can try to reduce the level of contamination or find a new water source. Responses could include:

- Removing or reducing the concentration of the contaminant with filters, barriers, or chemical purification.
- Finding a new source of water, such as bottled water, new underground wells, surface supplies, or clean surplus water from other sources.

Clearly, the different responses vary in form and cost. Household water treatments are not federally or state regulated—leaving practically no standard to measure their effectiveness. Moreover, replacing water sources may not be economically feasible, the economists point out. Many private homes may be unable to afford the several thousand dollars it can cost to dig a new well.

Connecting private rural residences to a public water source is perhaps the safest alternative. But, according to estimates, that could cost a prohibitive $12,000 or more, depending on how far a household is from a public supply.

Possible Actions

The economists suggest that perhaps the best "solution" is an adequate education program to teach farmers using chemicals how to avoid causing groundwater problems. But since little is known about how specific farming practices affect or contribute to contamination, more research is needed here, too. For example, minimum-till or no-till planting reduces the amount of soil erosion but may increase the amount of chemicals that pass through the soil and therefore enter the groundwater, Lee says.

"Farmers, who may be the first to feel the effects of a contamination accident due to their proximity to the chemicals, seem receptive to protective measures," says Lee. "Unfortunately, there is little advice to give them about how their activities affect groundwater quality."

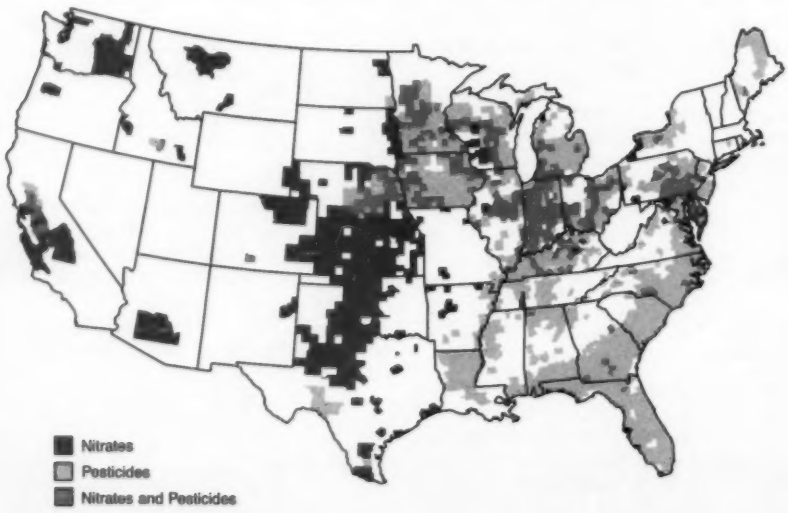
Some towns and counties, and a few states such as Arizona, Wisconsin, and Nebraska, have already passed laws to protect their groundwater. The Iowa Fertilizer and Chemical Dealers Association is helping finance research of nitrogen use. California, under its Proposition 65, is considering limiting the use of chemicals that are predisposed to leaching. Virginia has set up a Water Resources Research Center to educate its citizens and help local authorities develop protection plans.

While few hard-and-fast rules can be drawn, the economists say different strategies may be needed to protect underground reservoirs from agricultural chemicals. One possible strategy is to put a tax on fertilizers in areas where nitrate contamination appears likely. This could generate enough to cover the costs of monitoring and replacing contaminated water supplies. But for areas with potential pesticide contamination, prevention may be the key. (Monitoring and remedial costs for the estimated 5.6 million wells would be very high, the economists say.)

"Major uncertainties remain concerning the human health risks and costs associated with contamination," says Lee. Undoubtedly, more research is needed to shed light on these uncertainties and help local governments develop effective prevention and cleanup strategies, Nielsen and Lee say. □

[*Based primarily on information provided by Linda Lee and Elizabeth Nielsen of the Resources and Technology Division, Economic Research Service.*]

The Corn Belt and Great Lakes States Have the Greatest Potential for Contamination of Groundwater from a Combination of Nitrates and Pesticides



Farm Stress Hits Unevenly

For some farmers, it is a crisis serious enough to force them out of agriculture. For some others, the hard times have passed them by.

For the majority of commercial farmers, perhaps, the crisis has meant a painful adjustment to lower farmland values, weaker exports, a more frugal cost and debt structure, and reduced expectations.

The financial stress in agriculture has hit farmers and rural communities unevenly, according to a recent study of how the U.S. farm sector is faring. The two economists who prepared the study offer their analysis of why conditions changed so dramatically in the 1980's, where the stress is hurting most, and how the farm sector as a whole is likely to emerge.

Here are a few of their conclusions:

- By the time the current adjustment ends, as many as 15 percent of all farm operators who were in business before 1980 may have left farming for financial reasons.
- The stress seems to be worst among the smaller commercial-size farms (those with annual sales of $40,000-$250,000), among dairy and cash grain operations, and among farms in the Northern Plains and Great Lakes regions. Younger farmers are also being hit hard. More than 20 percent of operators under 35 reported economic conditions that suggest financial stress, compared with only about 7 percent of operators age 55 and up.
- Overall, the nation's commercial farms, which account for 90 percent of all U.S. farm production, remain profitable. Average household incomes (after farm expenses) match or exceed average incomes of nonfarm households.
- Agriculture's troubles have hobbled the economies of many rural communities that depend on farming or farm-related businesses—particularly in areas tied to export-sensitive crops such as corn, wheat, soybeans, and cotton.

The U.S. Farm Sector: How Is It Weathering the 1980's? *by David Harrington and Thomas Carlin. (Published April 1987; 24 pages of text, tables, and charts; GPO Stock No. 001-019-00506-8; $1.50).*

China Aims for Livestock Gains

China leads the world in pork production and is the second largest producer of red meat, behind only the United States.

These are facts, but facts about China's livestock sector aren't always easy to come by. For two decades until the late 1970's, the Chinese government did not publish any new statistics even though its records on livestock raising go back more than 3,000 years.

Today, China is trying to catch up—not only in gathering information, but also in building a bigger, more efficient livestock sector. The data that have become available since 1979 provide some measure of the task ahead:

- Although China has more than five times as many hogs as the United States, it produces less than twice as much pork. More than 90 percent of its hogs are raised in the backyards of private households. So are most of China's chickens.
- The Chinese feed industry is still in its infancy.
- China has a large cattle herd, but most of the animals—along with horses, mules, water buffalo and even camels—are valued for their muscle rather than their meat.

Even if China tries to build a modern feed processing industry and makes further progress in improving feeding efficiency, some increase in feed grain imports may be needed toward the end of this decade. Imports of protein meal are also possible.

This report analyzes China's livestock sector, describes the problems and prospects it faces, and provides more than 40 pages of vital statistics on such key indicators as animal numbers and meat production. It also outlines quarantine and health regulations for American cattle and hogs exported to China.

China's Livestock Sector *by Francis Tuan. (Published April 1987; 82 pages of text and data tables; GPO Stock No. 001-019-00505-0; $3.00.)*

Name_____
Company_____
Address_____
City, State, Zip_____

Mail order form to:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Please send me ____ copies of:

The U.S. Farm Sector: How Is It Weathering the 1980's?
SN 001-019-00506-8 $1.50

Total charges $_____

Please send me ____ copies of:

China's Livestock Sector
SN 001-019-00505-0
$3.00

For faster service, call GPO's order desk at (202) 783-3238 and charge your purchase to your VISA, MasterCard, Choice, or GPO Deposit Account.

☐ Enclosed is $____ (check or money order payable to the Superintendent of Documents. Please do not send cash or stamps). Add 25% for any foreign address.

☐ Charge to my Deposit Account_____

☐ Charge to ☐ Visa ☐ MasterCard ☐ Choice

Account No._____ Expiration date_____

Signature_____

For Office Use Only

Quantity Charges
Enclosed
To be mailed
Subscriptions
Postage
Foreign handling
MMOB
OPNR
UPNS
Discount
Refund

Catfish 'Feedlots' Expand Across the South

Catfish are jumping. Not the river "cats" extolled in the popular Doobie Brothers song of the 1970's, but their pampered, grain-fed cousins that populate aquaculture ponds in the warmer regions of the United States.

"Catfish farming is booming," says analyst Dwight Gadsby of USDA's Economic Research Service. "There has been tremendous growth in these underwater feedlots, with perhaps as much as 135,000 acres of catfish ponds currently in production in the United States."

The amount of catfish processed in this country jumped elevenfold between 1976 and 1986, from less than 19 million pounds to nearly 212 million pounds, according to USDA reports. And production is still increasing, with 70 million pounds processed during just the first 3 months of 1987.

The industry showed rapid growth in the early 1970's, but also experienced a brief setback in production increases, says statistician Ron Sitzman of USDA's National Agricultural Statistics Service. The volume of catfish processed jumped from 5.7 million pounds in 1970 to 19.7 million in 1973. Then output took a 2-year tumble, dropping to 16.1 million pounds by 1975. In 1976, the industry recovered and has seen consistent growth since, says Sitzman.

Mississippi is the leading state in catfish farming, but several other states also have significant production. "We are seeing expansion in Mississippi, the Carolinas, Georgia, Florida, Alabama, Louisiana, Arkansas, Texas, and on the West Coast," says Sitzman.

A 1981 USDA survey of the catfish industry put the number of producers in the United States at 987. But that was a one-time-only census and most likely the number has increased, the analysts say. USDA publishes a monthly catfish production report, with the estimates based on the amount of catfish handled by a sample of processors.

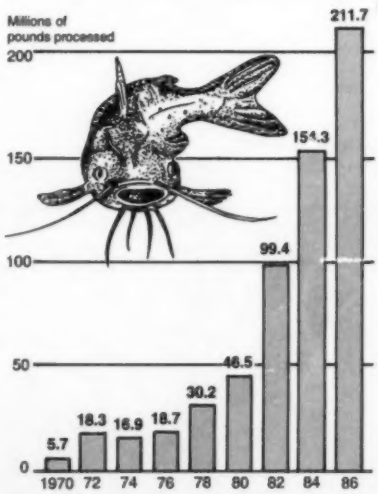
Growing Demand

Part of the industry's growth reflects a wider trend. Consumers have shifted toward more fish and poultry in their diet. Between 1970 and 1985, U.S. consumption of all fish increased 23 percent, from 11.8 pounds to 14.5 pounds annually per person. "There is little reason to believe that the upward trend should change," says Gadsby.

The increase in fish consumption occurred while prices were rising substantially because traditional supplies failed to keep pace with demand. Between 1970 and 1985, the Consumer Price Index for fish jumped 244 percent, while the corresponding price index of meat (beef, pork and lamb) was rising 126 percent.

Because the demand for fish has been growing, the food industry has increasingly turned to aquaculture to satisfy the American appetite. While traditional supplies have tightened (mostly because of conservation measures imposed on many fishing grounds), aquaculturists, including catfish growers, have become a dependable source of fish, Gadsby says. As a result, catfish are not only showing up in grocery stores, but also in restaurants, from fast food places like Church's Fried Chicken to a variety of gourmet restaurants in major cities.

U.S. Catfish Production Has Grown Steadily and Dramatically Since 1970



This increasing demand is being met mainly by a small number of large processing firms, each capable of processing at least 2,000 pounds of fish in an 8-hour shift. Some of the processing facilities are independently owned, some are part of larger conglomerates—such as Con Agra's Country Skillet—and others are cooperatives made up of member farmers who contract their catfish crop for processing.

Once such cooperative, Delta Catfish Processors, Inc., of Indianola, Miss., has more than 160 farmer members. Delta promotes "farm-raised, grain-fed" catfish under its Delta Pride label. Various processors, including Delta, have been instrumental in bringing producers together, providing quality control, encouraging year-round production, and improving the market for catfish products, Sitzman says.

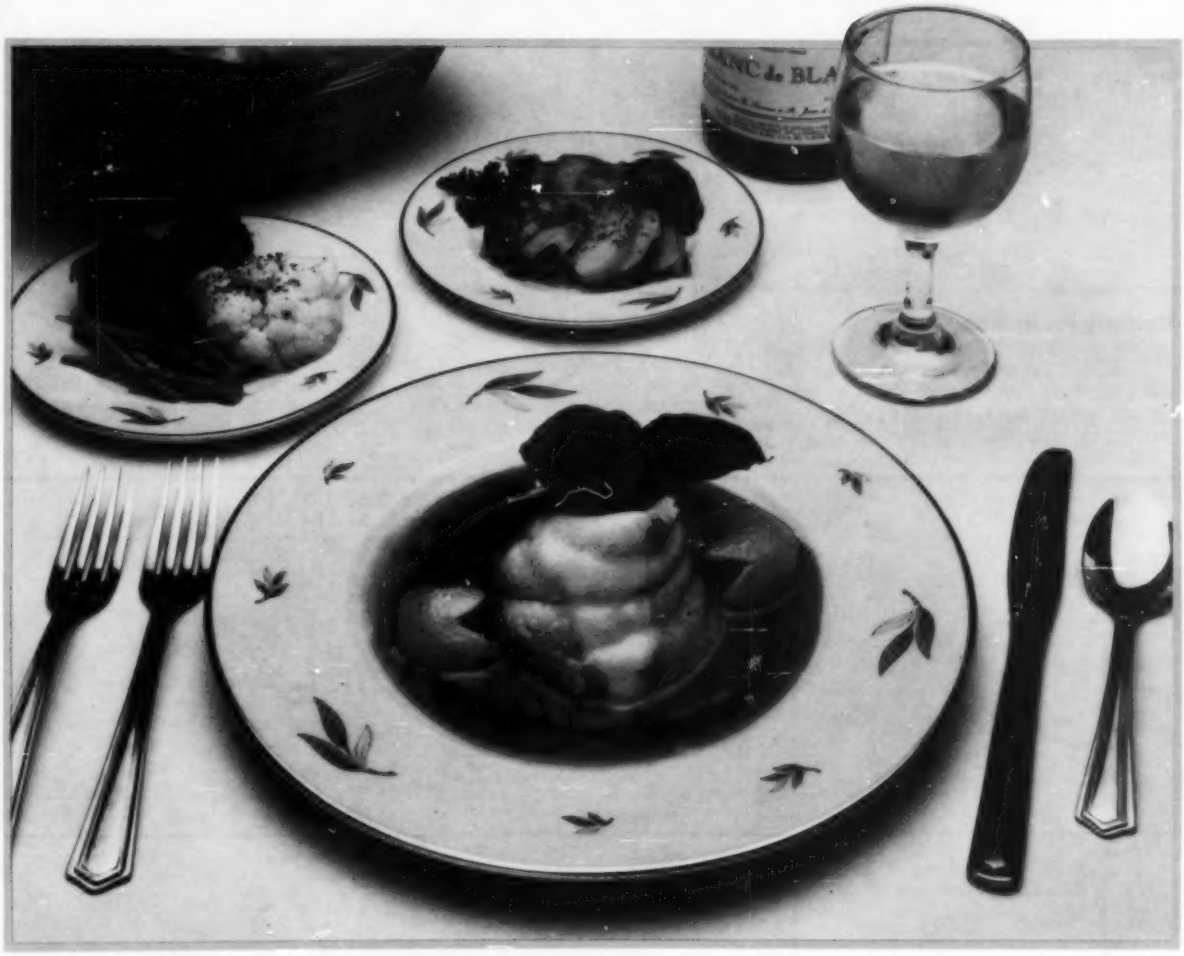
In addition to promotional campaigns, processors are leading the way in sponsoring industry research and in obtaining congressional support, says Sitzman. For example, they have been active in getting catfish added to the menus of prisons and other institutions.

No Get-Rich-Quick Business

Despite the growing demand for catfish, producers do not appear to be hooking higher prices for their product, says Gadsby. The price paid by processors has risen from 34 cents a pound in 1970 to 67 cents last year. "But when you adjust those prices for inflation, farmers actually got less last year for their fish than they did in 1970," says Gadsby.

There are other pitfalls in catfish farming. Producers are still plagued by algae growth, water-borne disease, variable oxygen levels, and the perplexing syndrome of "off flavor" — when catfish develop an undesirable taste. "It is difficult to quantify or qualify, but it is a real problem for a quality-conscious industry," says Sitzman.

Taste-testing is used extensively to prevent off-flavor fish from reaching the market. Tasters employed by the processors test the fish a week before harvesting, again the day before, and finally on the day the fish are to go to the processor. If the sample has



Stuffed Turban of Catfish is a specialty of Lafitte's Landing, Donaldsonville, LA.

an off flavor, the entire pond of fish is rejected.

It can be very costly for a producer if he is left with a pond full of fish that have been fed for a year or more. Feeding can be continued, in hopes the undesired flavor disappears, but there is no assurance it will, Sitzman says. In addition, the fish may grow to a larger size than the 1 to 2 pound weight preferred by processors.

Start-up costs are also substantial and operating costs are high, so catfish farming is not the answer for financially troubled farmers seeking a way to make ends meet, says Gadsby. Catfish farms are labor intensive and the highly processed feed is not cheap, Sitzman adds.

Obviously, producers can and do make money raising catfish. Farmers who are financially stable and who want to supplement their incomes might benefit from a catfish operation, but it takes good management, says Gadsby. "What they need to be successful is ample financing, appropriate land for ponds, and a good source of water."

It's a lot of work, he adds. "Catfish farmers need to monitor their ponds, keeping alert for disease, predators, pests, and poachers. And, as with any farming operation, they need to watch their markets closely. They may also want to join a cooperative to ensure a buyer for the fish."

Prospective aquaculturists should keep in mind not only the management and cost pitfalls, but also the advantages of proper location. Most catfish producers are in the South, for basically two reasons. One, points out Gadsby, is that water temperatures for much of the year are between 70 and 85 degrees Fahrenheit—the optimum growth range. The other reason, adds Sitzman, is the importance of being located near an established processor, and most of them are in the South.

"Starting your own processing plant could jeopardize an otherwise successful operation since the labor and management involved in processing catfish is so different from raising them," Sitzman cautions.

One of the biggest challenges the industry faces is continued expansion of its markets. Promotional efforts to get catfish on more dinner plates have been successful. Nevertheless, outside the main catfish-producing areas of the country, the fish still suffer from their traditional image as bottom-feeding scavengers.

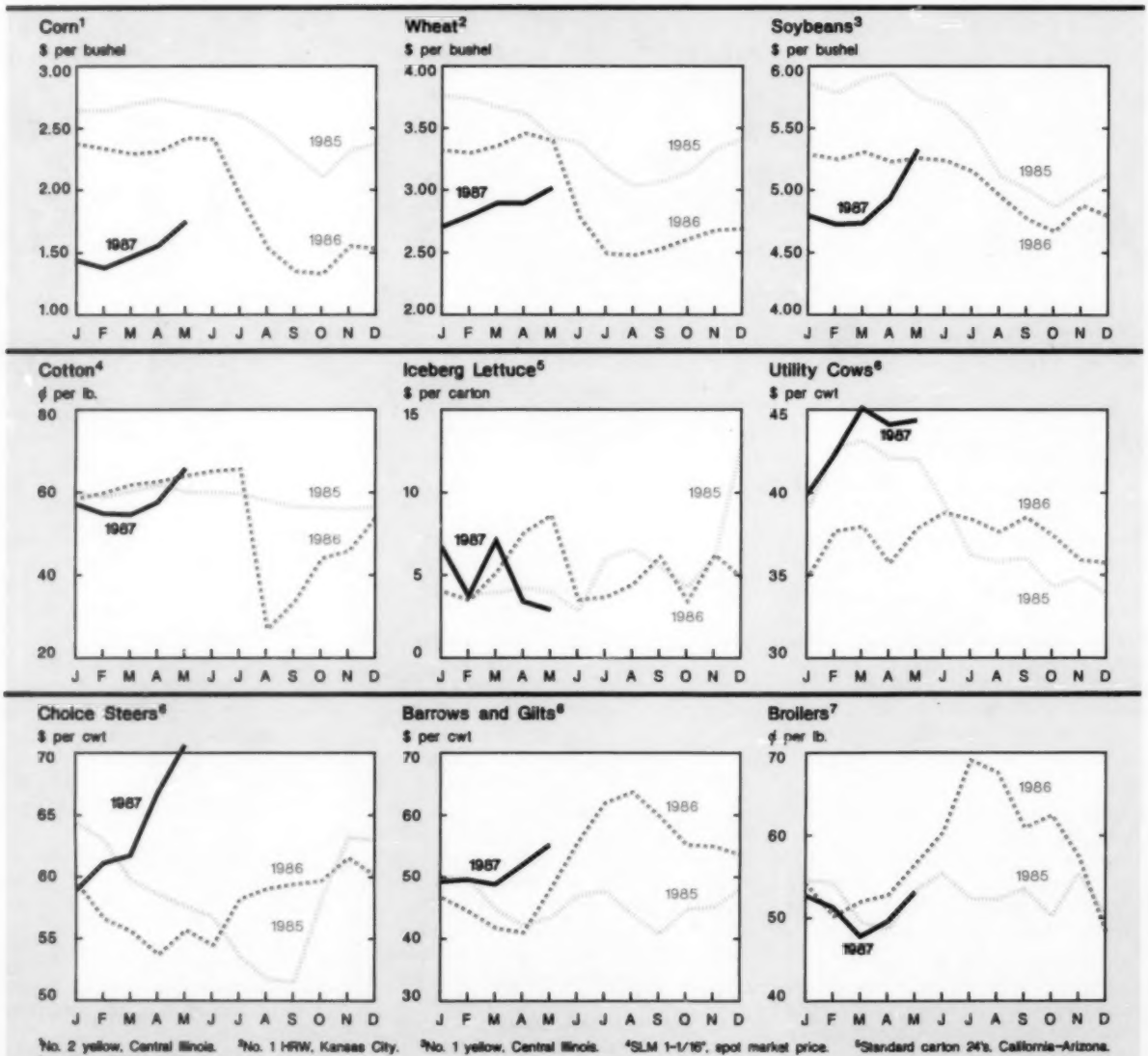
It is the people in these areas the industry needs to reach in order to find markets for its growing production, says Gadsby. □

[*Based on information provided by Dwight Gadsby of the Resources and Technology Division, Economic Research Service, and Ron Sitzman of the National Agricultural Statistics Service.*]

Monthly Price Monitor

USDA's May index of farm prices increased 3.2% from April and was 4.9% above its year-earlier level. Corn rose for the third straight month, reaching $1.75 per bushel, the highest in 10 months.

Wheat jumped above $3 for the first time since May 1986. Soybeans gained 40¢ to $5.33, the highest since July 1985 and the first time in 3 years that soybean prices were above year-earlier levels. Cotton climbed to 65.9¢ per lb., the highest since 1984. In the meat animals area, utility cows edged up to $44.40 per cwt, and choice steers rose $4 to $70.61 ($15 above their year-earlier price). Barrows and gilts gained more than $3 to $55.23, and broilers hit 53.1¢ per lb. All prices shown are monthly averages.



[1]No. 2 yellow, Central Illinois. [2]No. 1 HRW, Kansas City. [3]No. 1 yellow, Central Illinois. [4]SLM 1-1/16", spot market price. [5]Standard carton 24's, California-Arizona. [6]Omaha. [7]Wholesale, New York.

Agricultural Finances: Still a Mixed Picture

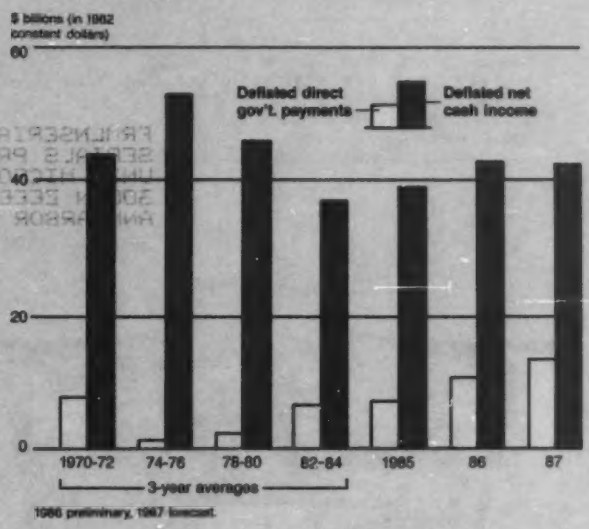
Lower Cash Receipts from Farming Are Being Offset by Higher Government Payments and Declining Cash Expenses

The Result: Record Net Cash Income in the Farm Sector

	1984	1985	1986 prelim.	1987 forecast
	in $ billions			
Farm cash receipts	142.1	142.1	134	126-128
Direct government payments	8.4	7.7	12	15-17
Farm-related income	4.3	6.4	5	4-6
Gross cash income	154.9	156.2	151	146-148
Cash expenses	115.6	112.1	102	98-98
Net cash income	39.3	44.0	49	48-52

After Adjustment for Inflation, However, Net Cash Income Remains Below Past Highs

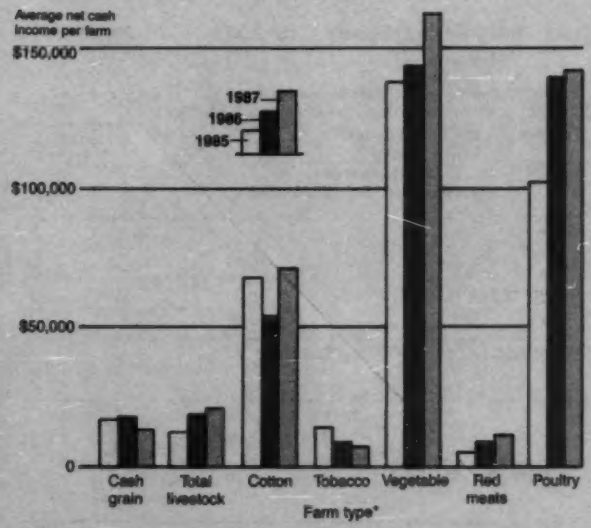
And It's Being Supported by Record Government Payments



1986 preliminary, 1987 forecast.

Average Net Cash Incomes Per Farm Are Down for Cash Grain Farms and Up for Livestock Operations

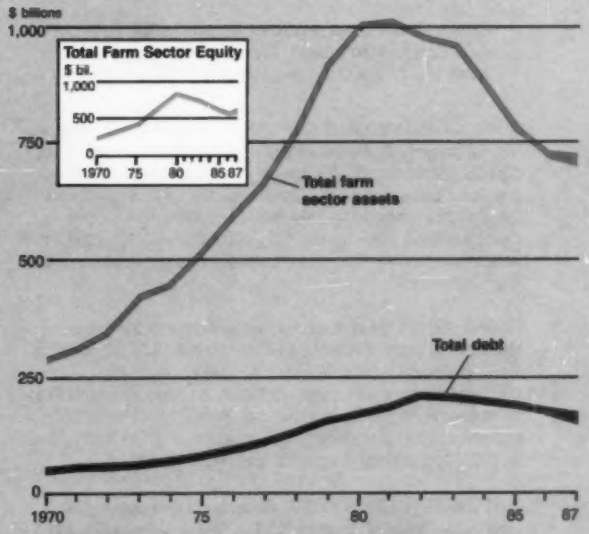
But Different Farms and Different Farm Types Show Different Patterns and Dramatically Different Incomes



* Farms are classified by the commodity or commodity group providing 50% or more of farm cash receipts.

On the Farm Sector's Balance Sheet, Asset Values Are Still Declining, But So Are Total Debts

For the First Time in 7 Years, the Sector's Overall Equity (Net Worth) Is Likely To Rise Slightly in 1987



1986 and 1987 are forecast. All data exclude debts and assets of operator households.

Data provided by economists Richard Kodl and Ken Erickson of the Agriculture and Rural Economy Division, Economic Research Service.

United States
Department of Agriculture
Washington, DC 20005-4789

OFFICIAL BUSINESS
Penalty for Private Use, $300

BULK RATE
POSTAGE & FEES PAID
U.S. Dept. of Agriculture
Permit No. G-145

To stop mailing ☐ or to change your address ☐ send mailing label on this magazine and new address to *FARMLINE*, Rm. 228-USDA, 1301 New York Ave. N.W., Washington, DC 20005-4789.

FRMLNSERIA300SJISSDUED11R 1 **
SERIALS PROCESSING **
UNIV MICROFILMS INTL **
300 N ZEEB RD **
ANN ARBOR MI 48106 **

Order Direct and Save!

Check these new, reduced subscription rates now offered on a user fee, cost-recovery basis from USDA's Economic Research Service

AGRICULTURAL OUTLOOK. **11 issues annually averaging 52 pages. Subscribe from ERS for $26 domestic; $32.50 foreign.** USDA's official outlet for farm income and food price forecasts. Data and discussion of issues ranging from international trade to prospects for commodity supply and demand, food marketing, agricultural policies, and other major issues affecting agriculture and the economy.

FARMLINE. **11 issues annually averaging 20 pages. Subscribe from ERS for $14 domestic; $17.50 foreign.** Farm economic information in an easily read style, reinforced with charts and statistics for those without time to review all the technical reports from ERS. Reports on all economic topics important to those involved in agriculture, with the focus on the causes and implications.

NATIONAL FOOD REVIEW. **Quarterly averaging 40 pages. Subscribe from ERS for $9.00 domestic; $11.25 foreign.** The latest developments in food prices, product safety, nutrition programs, consumption patterns, marketing, and processing technology for those who manage, monitor, or depend on the Nation's food system.

HOW TO ORDER. Check the box for each publication or insert the number of extra subscriptions you wish to order. Write one check or money order to cover total charges. You will receive a copy of the most current issue, and a letter acknowledging your subscription. Do not send cash. No credit cards. Sorry, no refunds. Foreign customers note: Only checks drawn on U.S. banks, cashier's checks, or international money orders accepted. For additional information, call (202) 786-1494.

Publication	Domestic	Outside U.S.
☐ Agricultural Outlook 11 issues	$26.00	$32.50
☐ Farmline 11 issues	$14.00	$17.50
☐ National Food Review Quarterly	$ 9.00	$11.25

Enclosed is my check or money order for $_____
Make check or money order payable to USDA/ERS
and mail to: ERS Publications
USDA, Room 228
1301 New York Ave., N.W.
Washington, DC 20005-4788

Name

Company or Organization

Street address or Post Office Box no.

City **State** **Zip code**

Daytime phone

OFFICE USE ONLY

Date Rec'd **Pubs Rec'd** **Last issue**

Amount **First issue**